

Total Gun Factors	Range in Hexes					
	1	2	3	4	5	6
1-2	1	0	-1	-2	-3	-3
3-4	2	1	0	-1	-2	-3
5-6	4	3	2	1	-1	-3
7-8	5	4	3	2	0	-2
9-10	8	6	5	3	1	-1
11-12	10	8	6	4	2	0
13-15	11	9	7	6	3	1
16-18	15	12	9	7	4	2
19-23	16	13	10	7	5	2
24-28	18	16	12	8	5	3
29+	19	17	14	9	7	4

Advanced Air Force

Page 1 of 3

All rolls are with a single six-sided die.

Find the Total Gun Factors value, determine the range in hexes and cross-reference the resulting number on the table below as the number of the column in which fire is resolved.

In each column, a number refers only to the type of hit that is the first to follow.

ROLL	-3	-2	-1	0	1	2	3	4	5	6	7	8	9
1	2F	2F	2F	2F	3F	3F	3F	4F	4F	4F	4F	4FW	4FW
2	FWL	2FWL	2FWL	2FWL	2FW2L	2FW2L	2FW2L	3FW2L	3FW2L	3FW2L	3FW2L	3F2W2L	3F2W2L
3	FWL	F2WL	F2WL	F2WL	F2W2L	F2W2L	F2W2L	F3W2L	F3W2L	F3W2L	F3W2L	2F3W2L	2F3W2L
4	FWG	FWG	FWG	F2WG	F2WG	F2WG	F3WG	F3WG	F3WG	F3WG	F4WG	F4WG	F4WG
5	FE	FE	FE	FE	F2E	F2E	F2E	2F2E	2F2E	2F2E	2F2E	3F2E	3F2E
6	WCE	WCEL	WCEL	WCEL	2WCEL	2WCEL	2WCEL	3WCEL	3WCEL	3WCEL	3WCEL	3W2CEL	3W2CEL

1. For the range determination of all types of gunfire, it is always the Resulting Game-Turn Altitude of both the firing aircraft and the target that will be used. The Resulting Game-Turn follows the Current Game-Turn, which is the last Game-Turn to have an effect on the aircraft positions of a Fire Resolution or Advantage Determination process that is incomplete. (Meaning that firing or Advantage possibilities are not exhausted.)

2. Firing on the First Advantage may only occur if the target is directly ahead in a straight path of hexes, unless the target's Silhouette Modifier is four or more, in which case the 12 o'clock position is sufficient to fire, as it is for all targets on the Second Consecutive Advantage. To repeat the Advantage the pursuer is required to use Power and Brake Factors only on the Current Game-Turn Airspeed, even if it initially doubles Brake/Power potential. This requirement exists and is possible only if a Second Consecutive Advantage is to be obtained. (This is known in advance to the Advantaged players since all the Disadvantaged players will move Disadvantaged aircrafts first, after all the unaffected aircrafts have their movements secretly written for the Current Game-Turn, but before the same has been done for Advantaged aircrafts.) Using Power Factors to add Dive Speed Points to the Current Game-Turn Airspeed is allowed with Advantage only if the Speed Point cost of the currently plotted maneuvers and/or climb reduces the Resulting Game-Turn Airspeed below Dive Speed. Declaring the Advantage forbids Disadvantaging and/or firing at other Disadvantaged fighter targets. Non-fighters may not be Advantaged without Fixed guns.

3. Advantage altitude limits; 1200 ft. above or below the Resulting Game-Turn Altitude of both aircrafts.

4. For the gunfire range determination of the altitude differential; 300 ft. equals one hex. (Ignore fractions.)

5. Maximum altitude difference for firing "FF" guns; 600 ft. from below, 1200 ft. from above.

6. Facing a target's 12 o'clock does not cancel a previous Advantage, but it does impose First Advantage requirements on firing fixed ("FF", "FH" or "FL") guns, which firing is not allowed from any inverted 12 o'clock attitude on the Resulting Game-Turn.

7. A Disadvantaged aircraft does not have any possibility of holding an Advantage, but it may still fire within First Advantage requirements.

8. When attacking a Disadvantaged aircraft or a straight-course bomber, a "Snapshot" Fire Resolution may be taken by the attacker if it crosses the target's Resulting hex position with a Resulting position no more than 2 horizontal hexes beyond the opposite side from which it entered. Attacking from a Current Altitude different from the target's Resulting Altitude requires the attacker to reach a mandatory Resulting Altitude relative to the target's own; 300 ft., this OPPOSITE to the attacker's Current Altitude. If the attacker's Current Altitude or Resulting hex position is identical to the target's Resulting Altitude/position, both Resulting Altitudes must match. Treat fixed "Snapshot" fire as 1 hex range K-14 High Deflection. If target hex is entered from the front hemisphere, treat all "Snapshot" fire as 1 hex single roll "F" Gunnery Play. Use entry side "F" Gunnery Play, 1 hex, always.

9. The available Climb Rate is reduced by 50% (ignore 50 ft. fractions) if any non-level or inverted flying is done during the Current Game-Turn, unless the inverted attitude is the result of a climbing Half-Loop, with no other maneuvers performed in the same Game-Turn. Climbing from any inverted attitude requires the use of red-numbered climbing Speed Point loss. Available Climb Rates: Maneuver/Level Sp.: green. Dive Sp.: red. "Available" includes black and red-numbered values. (See rule # 30.)

10. Reduce aircraft Stall Speed by one when no maneuvers are performed in a Level Bank Current Game-Turn. (Does not apply to Me-262A or Me-163B.) Displace aircraft 1 hex per 2 Game-Turns if an Airspeed of 0 is reached.

11. Interlocking front hemispheres: Treat any fire at a Resulting Sp. of 10+ combined Sp. Points as single roll "F" Gunnery Play.

12. Firing from the target's 2, 4, 8 or 10 o'clock (High Deflection); Special High Deflection Roll result must be **above five to hit** or allow entry into the Fire Resolution process. This restriction applies to all types of gunfire, including Flexible ("F") gunfire. If a target's Silhouette Modifier is above three (or ace fire); same restriction but Roll must be above 4. Note that in the case of a miss, ammunition is considered expended. K-14 sight; roll above 4 **only** if the High Deflection target made under 2 Turns.

13. Any inverted attitude at the Resulting Game-Turn altitude reduces the maximum Gun Range to 1 hex, and assumes 2022 speed/Hit Table rule is in effect. Add High Deflection restriction when High Deflection is combined with any inverted attitude.

14. An aircraft may be fired at only once per Game-Turn by Fixed ("FF", "FH" or "FL") guns and one additional time by Flexible ("F") guns, for a maximum total of two times per Game-Turn. Do not add Silhouette Modifier to non-"FH" guns.

15. Flexible ("F") guns must roll six to enter the Fire Resolution process, which each aircraft can only do once per Game-Turn. Aircrafts with four or more gun stations have a text immediately under the Target Characteristic Chart indicating how many times each aircraft may roll per Game-Turn to get its sole chance to fire its "F" guns. No indication means one roll only.

10	11	12	13	14	15	16	17	18	19
4FW	4FW	4FWE	5FWE	5F2WE	5F2W2E	6F2W2E	6F3W2E	6F3W3E	7F3W3E
3F2W2L	3F2W2L	3F2W3L	3F2W4L	4F2W4L	4F3W4L	4F3WE4L	4F3W2E4L	5F3W2E4L	5F3W3E4L
2F3W2L	2F3W2L	3F3W2L	4F3W2L	5F3W2L	5F3W3L	5F4W3L	5F4W4L	6F4W4L	6F5W4L
F4WG	2F4WG	2F4WG	2F4WGL	2F5WGL	3F5WGL	3F5WG2L	3F6WG2L	3F7WG2L	3F8WG2L
3F2E	4F2E	4F3E	5F3E	6F3E	6F4E	7F4E	8F4E	9F4E	9F5E
3W2CEL	3W2CEL	4W2CEL	4W2CEL	5W2CEL	5W2CE2L	5W2C2E2L	5W2C2E3L	5W2C2E4L	6W2C2E4L

Maximum number of rolls per target per Game-Turn; three, regardless of the number of available firing aircrafts. If the target is in the 6 o'clock straight path of hexes of firing aircraft, "F" guns need only to roll above 2 to enter the Fire Resolution process.

16. A Slip must be followed by at least one (-1) Turn. No Slip in any inverted attitude. Slip Airspeed cost: -2 (-1 in Dive Speed).

17. An aircraft must dive at least enough to gain one Speed Point to go into its Dive Speed Increment. Power Factors may not add any Dive Speed Points on the Resulting Game-Turn, and cannot be used while the aircraft is in its Dive Speed in the Current Game-Turn. (This does not apply to the exception stated in rule # 2.)

18. An aircraft in its Dive Speed at the Current Game-Turn must use one Brake Factor to simulate aerodynamic drag.

19. When the Current Game-Turn Dive Acceler. adds Sp. Points beyond the aircraft's Maximum Dive Sp., those extra Sp. Points are voided. Diving H-Loop mandatory Max. Dive additions = 0 acceler. : Use Max. Dive. Acceler. only (- H-Loop cost).

20. No climbing Half-Loop in any Current inverted attitude. No outside loop above a Current Game-Turn Airspeed of 4. A H-Loop can only be performed from a Level (L) or Inverted (I) Bank, and must use full Special H-Loop Max. Dive Rate or full Max. Dive Sp. Climb always. (Black Dive Sp. Climb value at Maneuver/Level Sp., red above, but both using black climb loss value.)

21. No Power Factors allowed in Current AND Resulting Game-Turn with H-Loop (if Advantaged, then only in the Resulting Game-Turn). H-Loop Airspeed cost: -1 in dive, -0 in climb from below 29.9, -1 in climb from above 29.9 (all: + alt. Sp. loss/gain).

22. For Flexible ("F") gunfire, Gun Factors of seven or less multiply each "C" hit by two, and those of eight or above multiply each "C" hit by three. "F" Gun Factors do not use the Silhouette Modifier, and may not fire while in a Turn or Slip hex.

23. When a multi-engine bomber is fired on from its 12 o'clock in a straight path of hexes, each "C" hit is multiplied by two.

24. Single engine: -1 to Max. Level Sp. for the first "E" hit, -1 Power Factor for each additional "E" hit. Twin engine: -1 Power Factor on the first "E" hit, -1 to Max. Level Sp. for each additional "E" hit. Single and twin engine Max. available climb: -.1 per "E" hit. II-2: -1 Power Factor and -1 to Max. Level Sp. from 3rd "E" hit only. P-47, FW-190A-8/R2, F4U and F6F: -1 to Max. Level Sp. from 2nd "E" hit, -1 Power Factor from 3rd "E" hit. For "E" hits only: A removed Max. Level Sp. Point remains identical except that you apply Dive Speed Power and Brake Factor restrictions. (See rules # 17-18.)

25. The first "C" hit removes Half-Loop maneuvers, the second "C" hit removes Half-Roll maneuvers.

26. Minus four Gun Factors on the front or on the rear hemisphere per "G" hit on Flexible ("F") guns.

27. Max. Dive Speed is reduced by one Sp. Point per two "W" hits. Max. Dive Rate and Dive Sp. Climb are reduced by .1 per "W" hit up to a maximum of -.4 (-.5 if 7+ "W" intact), at which point -1 to Max. Level Sp. and no Slip/H-Loop/H-Roll maneuvers allowed. For "W" hits: A removed Max. Level Sp. Point becomes "true" Dive Sp.. None of this is applicable to Heavy Bombers.

28. "Medium" arcs altitude limits; 100 ft. above and below the Resulting Game-Turn Altitude.

29. Half-Roll maneuvers may be the equivalent of two Bank maneuvers. (Airspeed cost: 0. "Full" H-Roll Airspeed cost: -.1.)

30. Altitude Change chart red-numbered values apply to Max. Dive/Dive Sp. Climb/Max. Climb. Those red-numbered values that are a higher number than the highest same altitude black-numbered value cannot be used in two consecutive Game-Turns in the same Altitude Change direction (climb/climb or dive/dive), and must use red-numbered Current Sp. Point loss (in case of climb only) as well as some opposite Altitude Change direction on the Resulting Game-Turn (.1 minimum).

Vertical Dive Rules;

1. A Vertical Dive (V. Dive) maneuver can only be initiated from a Current Airspeed of 7 or less and voids all subsequent Movement Points for this Game-Turn.

A Vertical Dive can only be performed by an aircraft with V. Dive Maneuver Requirements.

These Maneuver Requirements as displayed on Data Card apply to Level (L), Right Bank (RB) or Left Bank (LB) attitudes at the start of the maneuver. The Maneuver Requirement for V. Dive when inv. (non-L,R/LB) is always one Movement Point.

2. The Vertical Dive can be initiated from any attitude. The aircraft must stay in the same hex which can be exited on the subsequent Game-Turn in any direction and in a mandatory Level (L) Current Game-Turn Bank. Note that a single Game-Turn V. Dive must be declared and exited in the same Current Game-Turn.

When the V. Dive is declared exited, which can be done only at the end of the Current Game-Turn, the Resulting Airspeed on exit is always 2 Sp. Points below full Max. Dive Sp. after the 1st Game-Turn V. Dive, and 1 Sp. Point below after the 2nd Consecutive V. Dive Game-Turn. (Completely disregard Dive Acceleration, Brake or Power Factor characteristics.)

Note that a Second Consecutive Game-Turn V. Dive is not allowed to aircrafts with 4 remaining "W" hits or less.

3. Full use of the Max. V. Dive Rate is mandatory in a V. Dive. The Max. V. Dive Rate modifies the black Max. Dive values of the Data Card in the following amounts:

1st Game-Turn V. Dive: + 500%, 400% from Maneuver Sp. (Exit mandatory if Resulting Alt. below 500% black Max. Dive.)

This 1st Game-Turn V. Dive value is to be reduced by 500 ft. for each Movement Point expended in the Current Game-Turn to reach the V. Dive hex.

2nd Consecutive Game-Turn V. Dive: + 400% (ends with 3 Level (L) Bank Movement Points, 2 if Advantaged opt.).

Note: Full use of "regular" Data Card red Max. Dive is mandatory on exited 1st Game-Turn V. Dive's Resulting Game-Turn.

On exit of Second Consecutive Game-Turn V. Dive, the Resulting Game-Turn's survival is a single die roll that must be at least 2 below remaining # of "W" hits if under 50% black Max. Dive used, otherwise roll result must not be above.

4. An Advantaged aircraft may maintain its Advantage over an aircraft in a Vertical Dive if it can reach the Vertical Dive hex of the Disadvantaged aircraft or an hex within 2 hexes of it inclusively. It may then perform a Vertical Dive in this hex, reducing its Max. Vertical Dive Rate value by 500 ft. for each Movement Point it had to expend to reach its own V. Dive. (Subsequent Movement Points are, as usual, cancelled.) An Advantaged aircraft cannot gain Advantage over any other non-V. Diving aircraft while in V. Dive, but may fire on these with inverted restrictions (rule # 13) within V. Dive hex only. All this applies to the 1st Game-Turn V. Dive only, 2nd Consecutive Game-Turn V. Dive is the same but transfers these rules to 1 hex in front.
5. When a V. Dive is initiated, the maximum downward vertical Gun Range of all "FF" guns becomes identical at 1800 ft., and the gunfire range is still determined as 300 ft. = 1 hex. This means that all guns have a maximum vertical range of 6 hexes when in a V. Dive, and may fire downward in Vertical Dive hex exclusively. Applies 1 hex forward on 2nd, see #4 last phrase.
6. As soon as a V. Dive is initiated the vertical range of the Advantage is increased to 2400 ft. directly below, and is limited to the V. Dive hex and hexes within two hexes of it inclusively. Advantage may be gained or maintained only on an aircraft .1 or more directly below in this area that is itself in a V. Dive. There can be gunfire but no Advantage gain between V. Divers and non-V. Divers.

Gunfire from a non-V. Diving aircraft can only be "F" Gunnery Play and is treated as High Deflection while in a Current Game-Turn V. Dive.

Gunfire at a non-V. Diving aircraft is allowed within V. Dive hex only and inverted fire restrictions apply. (Rule # 13: 2X 300 ft. hexes = 600 ft. range maximum.)

Vertical Climb Rules;

The smallest (L/R) Slip Maneuver Requirement may be used to declare a Vertical Climb from any Current Airspeed, voiding all subsequent Movement Points in the Current G-Turn, but only if started from Level (L) Bank. V. Climb always, from any Current Airspeed, adds +1 above black Max. Dive Sp. Climb value for each Current Sp. Point that is above Stall Sp., and, in addition, +1 for each voided Current Movement Point. Firing guns in a Current G-Turn V. Climb makes a Resulting Stall mandatory.

Full use of the Max. V. Climb Rate is mandatory in a V. Climb. A V. Climb allows two consecutive Turn maneuvers within V. Climb hex, in either direction, with no Sp. Point cost but in a Resulting Bank (Inverted R/L opt.) matching direction of Turn.

V. Climb Sp. Point cost is -2 if from a Current Airspeed 2 Sp. Point or less above Stall Sp., making a Resulting Stall mandatory, otherwise Resulting G-Turn Airspeed is always 1 Sp. Point above Stall Sp. (Disregard all Power Factor characteristics.)

The Resulting G-Turn from V. Climb must be a full black-numbered Max. Dive in a Bank matching Turn direction, with no Current Power Factors allowed, even if Advantaged.

Special Data Card Note; Under the Speed Increments Chart color code box, the altitude limitation of Loaded condition indicated in the last line of the box applies only to Stall Speed and not to Level Speed, unless the line begins with "Both".

New Rules to better reflect WWII tactical reality (new research):

1-New 2022 Sustained Maneuver Speed Turning rule (Turn cost=0 Maneuver Sp. mode):

A Current Game-Turn starting in Maneuver Speed, and that uses **ONLY** Turn or Bank maneuvers, with **NO POWER, NO SLIP, NO H-ROLL** and **NO H-LOOP**, **MAY** have a Speed cost of **ZERO** for all these Turn maneuvers, **but ONLY if no Power Factor is used**. If climbing, **but only while turning**, within the Turn cost=0 mode, Sp. Point climb loss value must **always** be **RED**. **Regular non-Turn climbs still use black Sp. Point climb loss, even if in a Bank**. Turn cost=0 mode is not allowed in any inverted attitude. The Turn cost=0 mode does not obligate to perform any maneuver. **Very important: The (Maneuver Sp. exclusive) Turn cost=0 mode is the only mode allowing FULL Hit Table use without any 2022 Hit Table restrictions.**

(The FW-190A can thus do up to 4 consecutive Turns (to both sides) per Game-Turn, with no loss of speed. Same for the Me-109G to the Left. The A6M5 Zero should be limited to four Turns as well. The Ki-43-II would allow five Turns.)

The purpose of this rule is to encourage continuous low speed turn-fighting, as was observed to be a persisting (or increasing) trend in the later prop era, due to the longer sighting windows that this allowed to the low gun hit rate.

Turn fighting tended to “lock-in” the target, as rolling out of a turn was usually deadly, a fundamental rule of WWII turn-fighting being, once engaged, to never switch turn sides, something not always well reflected in this game.

To further enhance the (historically accurate) partial dominance of low-speed turn-fighting (clearly not a decreasing trend until the advent of jets), the new Speed/Hit Table rule below will allow the full Hit Table firepower only to aircrafts in a Resulting Game-Turn still within the Turn cost=0 mode, and thus within Maneuver Speed. The purpose is to reflect that flying faster than Maneuver Speed on the Resulting Game-Turn gives the guns less time to have an effect. Aiming ease is also reduced at higher speeds.

2-New 2022 fixed guns (“FF”, “FH” or “FL”) Speed/Hit Table rule:

In a Resulting Game-Turn that is still in Maneuver Speed, “FF” guns moving at that Resulting Speed may fire with the existing Hit Table **unchanged, IF OPERATING WITHIN THE TURN COST=0 MODE IN THE CURRENT GAME-TURN**. All “FF” guns firing from a Resulting Speed above Maneuver Speed must use the **2022 Hit Table rule: One Hit is none, two Hits is one, three Hits is one, four Hits is two**, etc... Optional: You may reduce ammo point expenditure to ½ point per Fire Resolution outside Turn cost=0 mode (Maneuver Sp.), since this becomes quite restrictive on experienced pilot lethality at higher speeds.

3-New 2022 Slip restriction: Only ONE Slip per Game-Turn may be performed.

4-2022 details for High Deflection restrictions: Roll above 5 to enter the “High Deflection” Fire Resolution process. Top aces, or +6 Silhouette and above, go down to only 3. “K-14” High Deflection requires above 4 to hit, **but if a target performed over one Turn in the Current Game-Turn: Above 5.**

5- Special notes concerning all Slip, or Turn, combined or not, Maneuver Requirement values of ½ or 0:

-Two consecutive Slips with a Maneuver Requirement of ½ (across two Game-Turns, since two Slips are never allowed within one Game-Turn, the Spitfire Mk V “Slip exception” being limited to one combined Turn) require **one** straight ahead Movement Point between them. The ½ Slip value cannot allow 3 Turns within the Slip hex, but the Slip may immediately follow a ½ Turn within the same hex, **but is then limited to a single combined Turn**. ½ Slip value can also combine with a ½ Bank/H-Roll value within the one hex.

-Turns of 0 Maneuver Requirement, if not combined with Slip, will count as one expended Movement Point (despite staying within the same Turn hex), while retaining the normal Resulting Airspeed cost outcome.

-Note that, when in the Turn cost=0 mode (no Power Factors, only Turns or Banks used), the number of available Movement Points does not restrict the number of possible 0 Turns (only the limit of 4 or 5 applies). One Movement Point is counted as **expended** for each Turn of 0, until none are left to expend. **Then** the extra 0 Turns remaining, **within the 4-5 limit**, have no Movement Point effect beyond pivoting the counter. The Resulting Airspeed of the Turn cost=0 Maneuver Speed mode is thus always equal to the Current Airspeed, barring turning climb (mandatory red cost), normal climb or brake losses, or dive gains.

6-Limitations for all Turn, Slip, Bank or H-Roll Maneuver Requirement values of 0:

-If using a Bank, or H-Roll, with a Maneuver Requirement of 0, **twice** in the same hex, the combined Maneuver Requirement value becomes 1. **A Turn value of 0 does not allow more than 3 Turns within a hex past the second Movement Point.**

7-New 2022 “F” Gunnery Play Speed/Hit Table rule: On Fighter targets faster than their Maneuver Speed on the Resulting Game-Turn, all “F” fire is treated **the same** as “FF” guns firing from above Maneuver Sp., **EXCEPT for “F” and “W” hits only:** For these hits, **one-two Hits are none, three Hits are one, four-five Hits are one, six Hits are two, etc...**